

I claim:

1. A method for molding panels in a sheet molding system comprised of a thermoplastic sheet delivery station and two mold halves, the method comprising the steps of

(a) delivering two sheeting layers of thermoplastic material between the two mold halves;

5 (b) inserting a rigidizing insert between the two sheeting layers of thermoplastic material;

(c) closing the mold halves to bring the two sheeting layers of thermoplastic material in contact with the insert; and

(d) compressing the thermoplastic sandwich between the mold halves to form a panel.

2. The method of claim 1 wherein at least part of the thermoplastic sheet delivery system is
10 disposed vertically above the mold halves.

3. The method of claim 1 wherein the thermoplastic sheet delivery system delivers at least two sheeting layers of thermoplastic material between the two mold halves downward from a position vertically above the mold halves.

4. The method of claim 1 wherein closing the mold halves to bring the two sheeting layers
15 of thermoplastic material in contact with the insert forms a thermoplastic-insert sandwich.

5. The methods of claim 1 wherein the thermoplastic sheet delivery station comprises one or more extruders.

6. The method of claim 5 wherein the thermoplastic sheet delivery station also comprises one or more pair of calendaring rollers.

20 7. The method of claim 1 wherein the thermoplastic sheet is a flax/polypropylene sheet.

8. The method of claim 1, further comprising the steps of delivering a layer of surface covering material to at least one mold half.

9. The method of claim 8, wherein the surface covering material is comprised of carpeting.

10. The method of claim 9, wherein the surface covering material is delivered to the mold half which forms a top side of the part formed.

11. The method of claim 1, wherein the thermoplastic sheeting layers delivered to both mold halves are comprised of the same thermoplastic material.

5 12. The method of claim 1, wherein the thermoplastic sheeting layers delivered to the mold halves are comprised of different thermoplastic material.

13. A thermoplastic-insert sandwich comprising at least two layers of thermoplastic sheeting layers abutting at least two sides of a pre-manufactured, rigidizing insert.

10 14. The thermoplastic-insert sandwich of claim 13 wherein the rigidizing insert is comprised of foam core material.

15. The thermoplastic-insert sandwich of claim 13 wherein the rigidizing insert is comprised of structural foam.

16. The thermoplastic-insert sandwich of claim 13 wherein the rigidizing insert is comprised of compatible thermoplastic foam.

15 17. The thermoplastic-insert sandwich of claim 13 wherein the rigidizing insert is comprised of thermoplastic honeycomb core material.

18. The thermoplastic-insert sandwich of claim 13 wherein the rigidizing insert is comprised of soundproofing/acoustic foam.

20 19. The thermoplastic sandwich of claim 13, further comprising a layer of decorative material.

20. The thermoplastic-insert sandwich of claim 13 or 19 wherein the sandwich is essentially free of any adhesive material.

21. A laminate panel comprised of two or more molded layers of thermoplastic sheeting layers abutting a pre-manufactured insert.

22. The laminate panel of claim 21 wherein the panel is essentially free of any adhesive material.

5 23. The laminate panel of claim 21 wherein the thermoplastic sheeting layers are thermoplastically bonded to the insert.

24. The laminate panel of claim 21 wherein the insert assists in rigidizing the panel.

25. The laminate panel of claim 21 wherein the rigidizing insert is comprised of foam core material.

10 26. The laminate panel of claim 21 wherein the rigidizing insert is comprised of structural foam.

27. The laminate panel of claim 21 wherein the rigidizing insert is comprised of compatible thermoplastic foam.

15 28. The laminate panel of claim 21 wherein the rigidizing insert is comprised of thermoplastic honeycomb core material.

29. The laminate panel of claim 21 wherein the rigidizing insert is comprised of soundproofing or acoustic foam.

30. The laminate panel of claim 21 or 22 wherein the laminate panel is an automotive trim panel.

20 31. The laminate panel of claim 30 wherein the laminate panel is further comprised of a decorative layer.